"THE

T R E A T M E N T

of

L U P U S V U L G A R I S

by the

Röntgen-Rays," being

A THESIS

humbly presented to

The Examiners for the

M. D. degree.

by

April 29th 1904.

P R E F A C E.

It may seem presumptuous for one absorbed in the common round of General Practice to undertake the treatment of a subject which can be much more properly dealt with by those who are more actively engaged either in the study of Radio-therapeutics, or in the still larger feild of Dermatology. Yet when it is remembered that the whole treatment by this method has been in use omly during the last five years, and that soon after the introduction of that method it was my good fortune to treat a case, the conclusions of which were in accordance with the observations of eminent observers, I feel emboldened to offer this paper as a suitable one for Graduation purposes.

The discovery of Radiography occured five months after the date on which it was my privelege to graduate as Bachelor of Medicine and Master of Surgery, so that my work in this department has been performed without any previous education in the technique of Radio-therapy. For the many defects and insufficiencies of this paper, then, I must implore the kind indulgence of the examiners.

My thanks are due to Professor kynoch, Dundee, for kind assistance in procuring the necessary literature, to Miss McIntosh, Arbroath, for revising and correcting translations, and to Mr John Geddes, for Photographs.

I N T R O D U C T I O N.

In December, 1895, Professor Wilhelm Conrad Röntgen Gave to the Wurzburg Physico-Medical Society, and to the whole world ,a paper entitled, "A new form of Radiation", which was destined to mark the commencement of a new era in skin-therapeutics. For although the reactions of this new influence on healthy and diseased skin were not understood until some time after Rontgen's discovery, the work done by that eminent scientist laid the foundation of future valuable research. Numberless troublesome skin diseases have been treated more or less successfully by this method. The irradiation treatment is now a recognised one in such affections as Lupus Vulgaris, Sucosis Menti, Hypertrychosis, and Favus, while in many other kinds of skin trouble, such as Eczema, Psoriasis, Carcinoma of the skin, Lupus Erythematosus, and so on, great benefit has been known to result from the use of the rays.

We are concerned in this paper only with the effects produced in cases of Lupus Vulgaris, and it may be said at once that an endeavour has been made to limit the scope of the discussion to this form of skin disease as much as possible, because the area of subject matter is extensive enough for handling in a paper of these dimensions.

The following distribution of material may not be the most perfect one, but it is obvbously difficult to bring

a vast number of facts into any conformity , unless such or a similar method be employed. It has been my intention to state the various details, firstly as observed by myself and secondly as written by others, as clearly , concisely, and truthfully, as possible, knowing full well the many difficulties entailed.

We propose, then, to deal with our subject under the following headings:

I. A brief account of theApparatus used by the author of this paper during the last four and a half years for Röntgen photography, and to a limited extent also for Radio-therapeutics.

2. The history of a Case of Lupus Vulgaris, treated by the X-Rays. with a short description of the technique employed.

3. A historical record of the earlier papers on the subject of the treatment of Lupus by these means.

4. An analytical and critical exposition of the most important work of foreign and British authorities dealing with the same.

5. A note on the histological researches regarding tissues treated therapeutically by these means.

A P P A R A T U S.

The instruments hereafter described were made for me in December, 1899, by Mr J. W. Lowdon, Dundee, to my specification. Knowing the drawbacks attendant on the want of a continuous current of electricity from the main, I requested the maker to provide me with a coil capable of producing a maximum spark length of 16-17 c.m. A coil of this power was being used largely at that date and as my object was to be able to take skiagraphs of injuries and diseases of bones in the upper and lower extremities, a stronger coil was not deemed desirable. The instruments supplied were found to answer my limited requirements in every respect, so much so that I found my results in Radiography all that could be desired. In many cases foreign bodies were located, fractures diagnosed, and diseases of bone recognised. Constant use of the rays made me familiar with the intricacies and adjustents of the apparatus, with the possibilities under different variations of exposure, as well as with the difficulties of developing plates.

The accompanying photograph, (No.I.), shows the apparatus fixedup, and ready for use, unless that the dischargers have been left in the transformer showing the spark length usually obtained. The individual parts are :

Accumulator with Rheostat.

Coil, or " Transformer".

Mercury Interrupter, with Bichromate Cell.

Tube.

Tube- holder, and other connections.

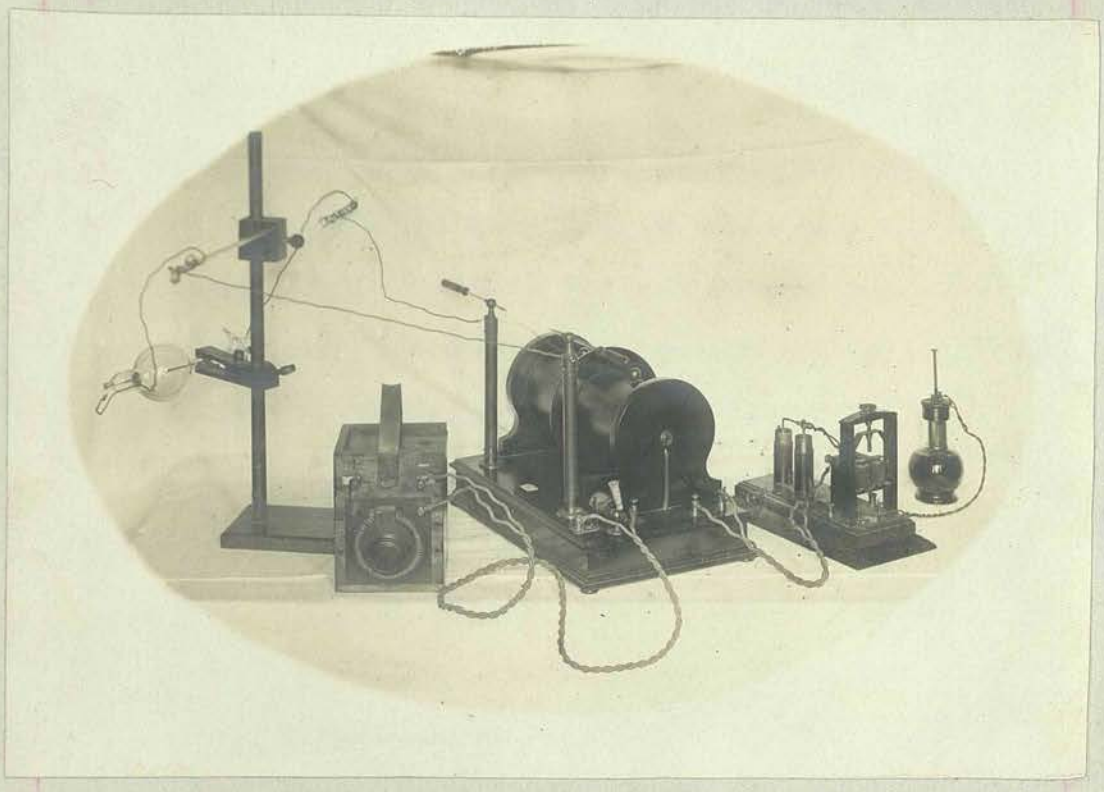

Photo. No. I.

It may be mentioned that neither a Volt-meter nor Ammeter have ever been a part of the equipment, although when tested by these means the primary current in the accumulator was found to show 8 Volts, with an amperage from 3--5.

Accumulator.

The Rheostat in connection with the primary current was found to be an advantageous addition, as a fairly steady supply of electricity could thereby be maintained. The resistance was gradually diminished when the blue-green light in the tube became fainter, so that the amperage may be taken at the lower figure instead of the higher, as being the ordinary current employed.

The accumulator was charged for me at a small electric-lighting station by the electrician there. While the rays were being used in the case which follows, the accumulator was recharged after every second sitting, so as to keep the current at its highest working power. After about eighteen months of fairly continuous use it was found that the current became very unsatisfactory. The instrument was accordingly sent to the maker and new plates had to be inserted.

Coil.

The Ruhmkorff Coil, or "transformer," was a well-made and compact instrument, and not too large for being carried here andthere for the purpose of taking skiagraphs. The secondary wire of over five miles in length was so well insulated that only after a very long time did I have any trouble , and even then the insulation would

not have gone wrong had it not been for the constant spraying of methylated spirit on the coil from the cylinder of the mercury interrupter.

Interrupter.

For the purpose of making and breaking the current in the primary circuit, an interrupter of simple device was used. The motor power was obtained from a Bichromate Cell by means of an electric-bell-like arrangement, which operated on a hammer with piston rod attached. This piston passed into a cylinder with a small quantity of mercury and by its vibrations caused an interrupted current in the transformer. This instrument was a source of constant annoyance owing to the occasional great difficulty of adjustment. The Bichromate Cell also required very careful handling as the motive power diminished rapidly as the zinc became affected by the solution. Fresh fluid had to be added repeatedly, as well as new zincs in the cell. Had it been possible to obtain a continuous current from the main this part of the apparatus would have been much simplified, for either an electrolytic interrupter such as Wehnelt's, or one or other motor arrangement might have been employed. As this was impossible, an endeavour was made to use the above to the best advantage. The number of interruptions per minute according to the maker, varied between 250 and 750. The number usually was nearly as high as the larger figure, in other words about 650.

Tubes.

Three different forms ot Tube have been used for skiagraphic purposes, although the one employed for the case of Lupus hereafter to be described was one which was supplied with a vacuum-reliever, and for this reason it was considered the best of the three. This arrangement proved of much assistance, because the tendency for the tube was to become "hard", and a better light was always obtained after the tension within the tube was reduced by this means. Mr Lowdon informs me that the maker's name was Cossar, London.

Tube-holder.

This was made of wood fitted with glass-rods to keep the wires from the coil at a sufficient distance.

On the whole the apparatus described worked with great smoothness, and with little trouble unless such as inexperience brings in its train. Difficulties were surmounted in the course of time and gradually it became a very great pleasure to use the instrument. I may therefore be excused in saying that it is a metter of some surprise to me that when the Röntgen Rays can be produced in such a simple way, that so few general practitioners avail themselves of so important a weapon of diagnosis.

C A S E of L U P U S V U L G A R I S treated by X-R A Y S.

James Dilly, aged 33 years, factory worker, has resided in Arbroath all his life.

Family History. Father died of cancer of stomach at 47, but patient remembers that he had on both sides of neck white scars, the remains of some affection earlier than patient's recollection. Mother died of fatty degeneration of the heart at 58.

He has 5 brothers and 2 sisters , all of whom are alive and in good health. One sister, when I6 years of age, went to Aberdeen Infirmary and had a gland removed on the right side of the neck. She has had no further trouble since.

Patient has two children, aged (at the time of writing this), 5 and 3 respectively. They are both in good health and have always been so unless that at 2 years of age the elder suffered from a gland in the neck becoming swollen. It disappeared after a few weeks, leaving no residue.

Previous Illnesses. When very young, patient had measles. At I2 years of age, the glands on both sides of the neck suppurated, and after many months healed leaving numbers of scars.

History of Present Illness.

In February, I897, patient noticed some irritation in the nose, and as he expresses it, his "nose got choked". Soon after the eyes became swollen and inflamed, and a great deal of dischargecame from the inner corners of the eyes. He went to Aberdeen Infirmaryin April, I897,

and under Dr McKenzie Davidson, had both tear-ducts treated and "probes" inserted. After being treated there for 3 weeks he came home much improved, but in August of the same year he returned to Aberdeen, owing to another attack of the same trouble. On this occasion Iodoform ointment was used and Atropine drops for the eyes, as there was some ulceration there. The nose was much swollen, red, and painful. He remained under Dr McKenzie Davidson for 2 months and one week, and came home a great deal better, although the redness was not quite away from the nose. He still experienced a choking sensation in the nostrils.

In December, 1897, the condition became more annoying again, and this time patient went to Edinburgh Royal Infirmary, where he was two months under Dr McBride, who scraped the interior of the nose for ulceration with marked benefitfollowing. The pain, which still existed in the eyes, disappeared after the scraping of the nose .
Dr Berry, of the Eye-wards , operated on him at this time because the right lower eye-lid was turned down. This operation, (for ectropion), was very successful.
After being 2 months in the Edinburgh Infirmary, he came home much better, but still complaining of some choking sensation in the nose.
The condition remained much the same until February, 1900. when a spot appeared on the right cheek, then one or two on the nose, these being covered over by crust, and occasionally discharging a little.

In May, 1900, patient was operated on in Arbroath Infirmary by Dr W. J. Dewar, whoscraped the diseased tissue on the nose. He left after afortnight feeling only a slight improvement, which was not maintained longer than two or three weeks. The condition then seemed gradually to become worse until he presented himself to me in the beginning of June 1901.

Notes of Condition on 1st June, 1901,

The lower half of the surface of the nose is red, swollen, and covered with small crusts. the same condition extends over the right cheekfor a distance of 5 c.m. though the crusts are more numerous nearer the nose.

The mucous membrane of the nostrils is covered with slack crusts, while considerable discharge of stinking pale yellow pus oozes from the nostrils and covers the hair on his upper-lip. He cannot breathe at all, through his nose, and complains of the annoyance the oozing pus gives him during the night.

The eyes show ectropion on both sides, and on the right lower eye-lid is seen the scar from the operation performed in Edinburgh for that condition.

The neck on both sides shows under the hair, the scars above referred to, which w ere caused by old suppurating glands.

There are no white patches on either cornea.

The lungs show no signs of Tubercle, and the other organs are healthy.

The photograph shown, (No. 2.), was taken at this time before

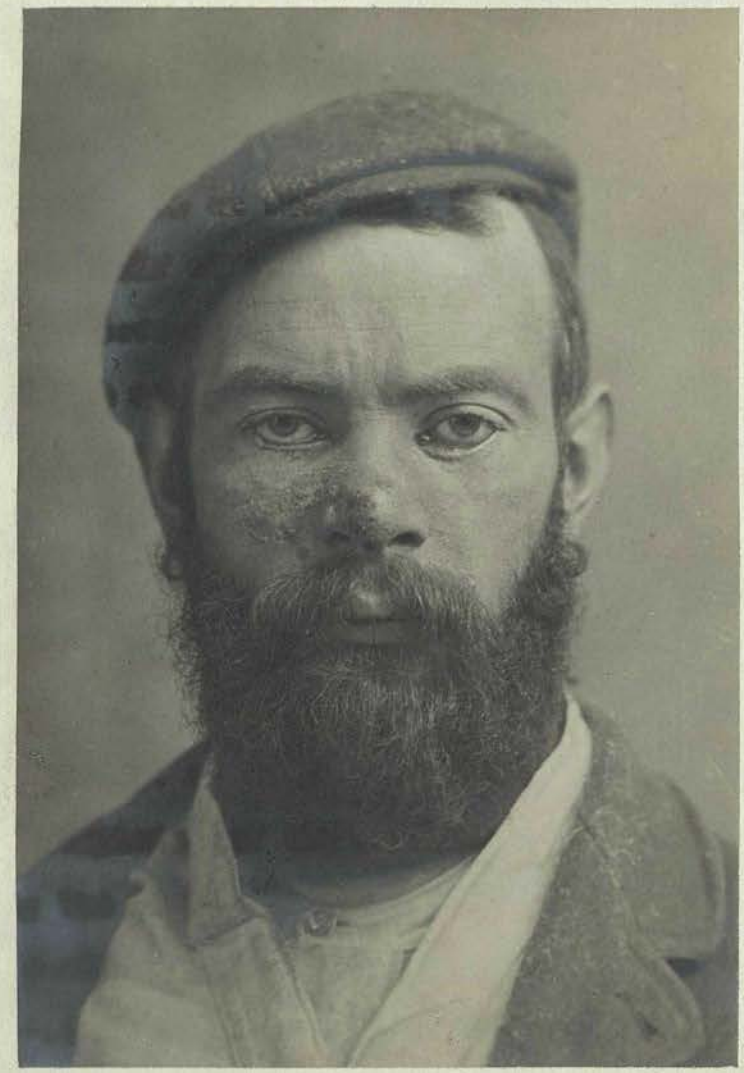

Photo. No. 2.

before any treatment had commenced. It is enlarged from a quarter plate, and is untouched. The general appearance was even more striking than is shown , or can be shown, by the photograph, as the redness of the patches, and the condition of the mucous membrane cannot be observed.

Dignosis.

From the history and clinical appearances, above mentioned, there was no difficulty in diagnosing Lupus Vulgaris, affecting the tissue of the nose, the skin of the right cheek, and the mucous membrane of both nostrils.

In spite of all the numerous attempts to affect a cure the process had extended itself so that apart from the facial disfigurement, the odour of the stinking discharge made life very disagreeable for the unfortunate man.

Accordingly it seemed to me that even with the simple apparatus at my command, the component parts of which are described above, it could at least do no harm to see whether or not the X-rays successfully used for photographic purposes, might produce any appreciable therapeutic effect in this case. I therefore determined to give the patient a trial, and for that end adopted the following technique.

Technique.

The maximum spark-length was never allowed to be under I5 c.m. owing to the re-charging being performed as it has been indicated.

The mercury interrupter was kept steadily producing interruptions as great in number as possible, namely from 650 to 700 per minute.

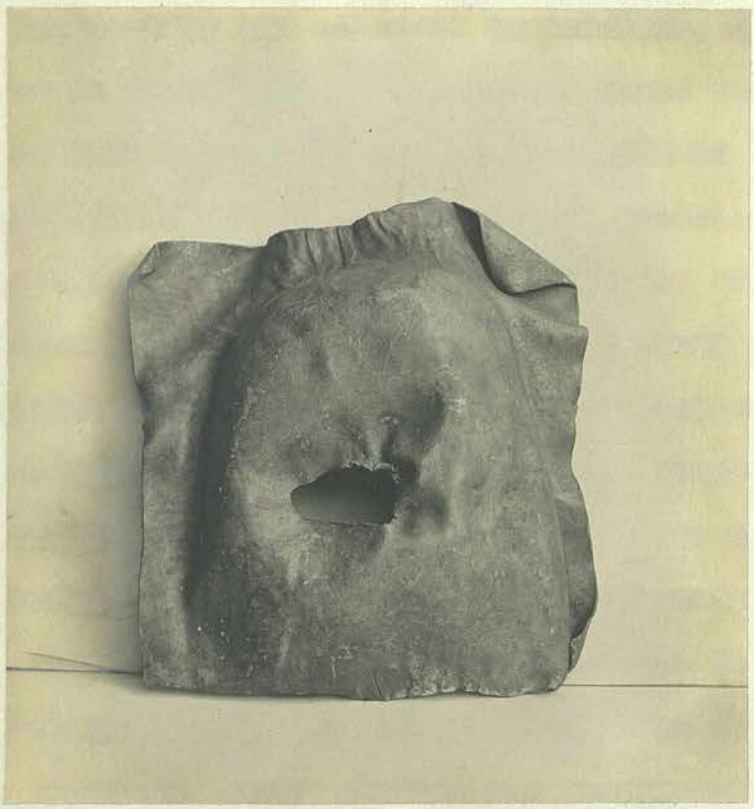

Photo. No. 3.

Mask.

The mask used in order to protect the eyes and parts of the face not to be irradiated, was made of ordinary sheet lead obtained from the plumber, and moulded into a shape as nearly like the head as possible. An opening was cut out to correspond exactly with the area of the affected parts on the nose and right cheek, so that when the mask was placed on the face only the lupus patches were seen. The edges of the opening were turned outwards slightly, but closely fitted the skin.
The patient lay on a couch with his head on a pillow, and after placing himself in a comfortable position, the tube was brought over and placed directly above the opening in the mask with the platinum anticathode perpendicularly above the centre of the exposed skin, and about I5 c.m. from the affected part. It was found that if the bulb of the tube were placed too near the maskthat a spark from one or other of the terminals passed to the lead . This naturally prevented the full discharge of current through the tube, but was also very troublesome to the patient.

The sittings were of I0 minutes duration to begin with, but later they were lengthened to I5. They were carried on at intervals of three and four days.

During the time of treatment no other therapeutic agency was employed chiefly because it seemed advisable to watch the action of the raysalone. At no time, however, during the progress of the case was it deemed necessary to use ointments

ointments, powders, or lotions. After what seemed a definite healed surface was obtained, an ointment was used with much benefit.

Treatment.

During the course of the treatment, the patient at my request kept a note firstly of the date and duration of exposure, and secondly of his subjective sensations. These notes, rough as they are, are valuable in this respect that they form evidence from the patient's point of view of the value of the result.

Patient's Notes.

June. I5th. I90I.

I0 minutes of the rays. Result a good deal dried up.

I8th. I0 minutes of rays. Result still drying up.

22nd. I0 minutes of the rays. Result getting a little itchy. Crust growing harder.

25th. I5 minutes of rays. Result, hardly any crust, and getting pretty dry.

29th. I5 minutes of rays. Result, still getting dryer. Looking very well.

July. 2nd. I0 minutes. Result., a little discharge, but no worse.

July. 5th. I5 minutes. Result. still discharging much the same.

9th. I5 minutes. Result. growing a little lessin size.

I3th. I5 minutes. Much the same as last. A little drier.

I6th. I5 minutes. Result: looking a good bit better: crust coming off frequently. Nose, a shade better. (Inside?)

July. 20th. I7 minutes. Result, much the same.

24th. I3 minutes. Result, much the same.

27th. I5 minutes. Result, a good bit better looking. Very dry.

August 3rd. I5 minutes. Result, much the same.

Aug. 6th. Result, grows very itchy, but much the same.

I7th. I2 minutes of the rays. Result beginning to close. Nose a little better inside.

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October. 8th. I5 minutes of rays.

Result, surface of nose perfectly dry, scars left. Inside of nose healed. Can breathe through nose at night. No smell now. Began to use ointment.

October. 25th, I5 minutes, rays.

Nose smoother and less red after ointment. Have never been so well since first I took bad.

The ointment referred to is Hebra's skin paste, containing equal parts of Sulphur. presip., potass. carbon., glycerine, spt. vini rect., and aether. sulph.

The results given by the patient are his own observations 24 hours after each irradiation.

Personal Notes.

During the treatment the process seemed to be one of slow drying , although it is difficult to say at which irradiation the other processes hereafter mentioned took place , the one merged so imperceptibly into the other. After the third sitting the patient complained of the affected part feeling "itchy"., but no swelling or redness appeared. On June, 25th, the crusts were much drier, and

and in one or two places had a tendency to separate. I advised the patient to remove gently any loose epidermis. He informed me that in the usual washing of the face several scales had come away. On July, 2nd, after 5 sittings there appeared to be three or four small ulcers, the size of a large-pin head, with sharp edges as if they had been punched out. These discharged a clear glistening fluid. The patient noticing this discharge of a new character says in his notes,"A little discharge but no worse", showing that he evidently recognised these small ulcerated points.

The drying continued still further in those cup-shaped ulcers and by July, 9th, they were nearly all closed up, leaving a slightly wrinkled surface, the wrinkles converging to a centre, at which point the former small ulceration had existed. On this date several new points had, so to speak, opened themselves up; or rather it may be said that by the removal of the filmy crust thes had been disclosed, so that there was still some moistness on the surface of the affected parts. The whole area seemed at this time to be appreciably reduced in size; the nose and cheek had become less swollen.

The condition of the mucous membrane within the nose showed a diminution of secretion, and a quite observable lessening of the disagreeable odour.

Sittings were continued as in the patient's notes, and on August, 3rd, after I3 sittings the following facts were noted.

The crusts had almost entirely disappeared, and the skin had a dry wrinkled appearance, the wrinkles being very fine with a dry surface.

The colour of the irradiated part had now changed from a bright red to a dark brown tint. In one or two places one could detect the remains of a point undergoing the changes above mentioned. The mucous membrane showed a less discharge, but the crusts there also had largely come away, and the odour had diminished. On August, 17th, after 15 irradiations the patient admitted that the nostrils were much freer and more comfortable. On the 25th August, when I saw the patient again, the discharge had ceased from the nostrils, the odour had gone, and the skin much reduced in swelling, seemed to be gradually assuming a paler colour and a firmer consistence. The irradiation was then stopped for five weeks. The patient speaks for himself as to the condition of the parts on and immediately after October, 25th, the date of the last sitting before the photograph which accompanies this paper (No.4.) was taken.

The nose had at this time not only dried but become cicatrised in several places. There were however, no definite scars on the nose as were seen on the the right cheek. These, if one may call them scars, were small depressed patches the size of a pea, and of a lightish brown colour. In these parts there were no downy hairs, or sweat-glands, and their surface was much smoother than the surrounding skin-tissue. The mucous membrane of the nostrils was smooth and dry, and the odour had entirely disapp eared. The ointment given on the 8th October, had softened the skin greatly, so that the difference of the patient's physiognomy from a cosmetic point of view was very satisfactory.

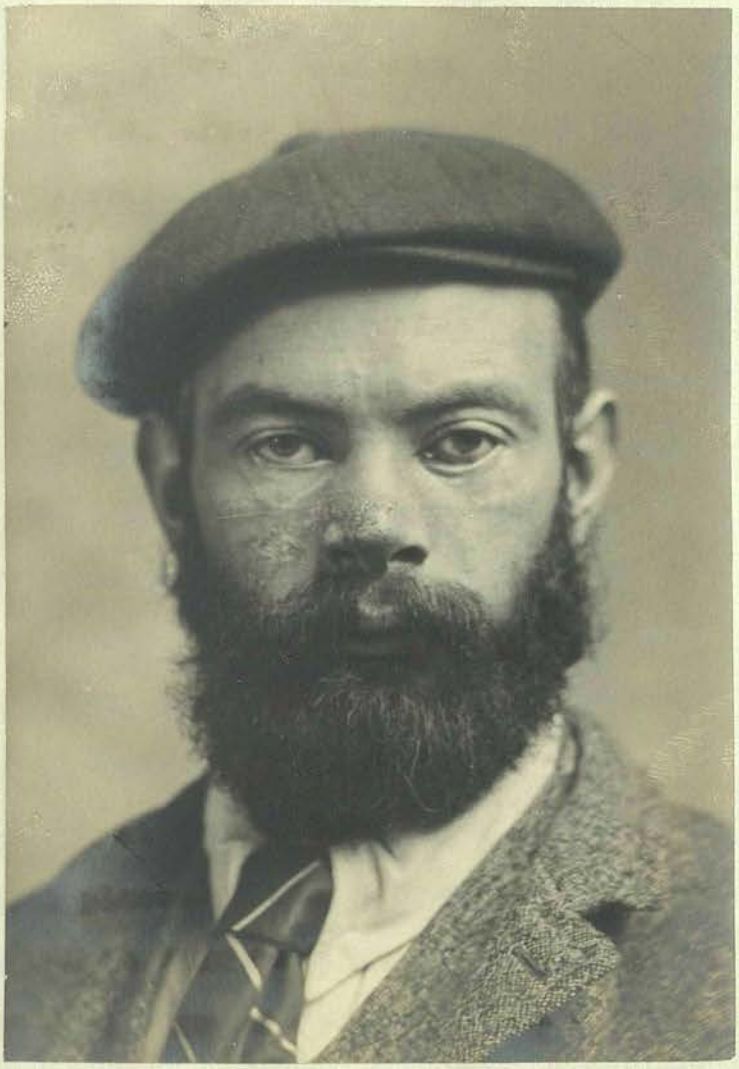

Photo: No. 4

The photograph accompanying this paper is an enlargement from a quarter plate and the whole is untouched. A comparison of this picture with the former one taken before the treatment commenced, shows many of the points described in the narrative. The depressed scars in the healed skin are easily detected , while it may be noticed that the old scar of the operation for ectropion is much more noticeable than before. One very important point, which I have observed in this case, and which is well seen in the photographs, is that although a cicatrisation of a kind has undoubtedly taken place, there has been no change for the worse in the condition of the lower eyelid on the right side.

The remarkable result described was of itself a great surprise to me as I could not have believed had I been told before attempting these irradiations, that this treatment would produce such beneficial effects. That the Rays , even in such moderate strength, would , and should be considered a valuable implement for therapeutic use, I had demonstrated to my own satisfaction.

The following clinical facts seem worthyof emphasis:

I. The absence of Dermatitis, unless the slight itchiness may be supposed to be an indication of Inflammation.

2. The gradual "throwing out" of the Lupus points, with the subsequent cicatrisation, and formation of finewrinkled skin; all with no local disturbance, no pain, and even with no discomfort.

3. The formation of so-called "scar" tissue, containing no hair-folliclesand no sweat-glands. This smooth tissue

becoming lighter in colour, until almost white.

4. The remarkable effect on the mucous membrane of the nostrils. The patient says in his notes that he could again breathe through his nose, and this seems to show that the whole tissue of the nose must have been penetrated by the rays, with an undoubted effect on the inner and further surfaces.

Subsequent History.

The patient returned to me in June, 1902, complaining of a relapse of his former disease. The nose was again swollen and red, and crusts had begun to gather. The right cheek showed a smooth white scar, similar to that before described but firmer , whiter, and evidently quite healed. The mucous membrane was red and inflamed, but the old odour had not returned.

After a number of irradiations, I became convinced that my apparatus was suffering from wear and tear, and this was confirmed when the accumulator was sent to the maker. Meanwhile I recommended the patient to apply for treatment at the Dundee Royal Infirmary, which institution had shortly before been equipped with a very efficient installation of X-ray and Finsen apparatus.

Owing to financial and economic reasons it was not until December, 1902, that he was able to make final arrangements for daily visiting at so great a distance. From that date until February of this year he was continuously treated by the Finsen method, in all having received 160 sittings.

Dr Fraser, Medical Superintendent of the Dundee Infirmary, who personally looks after this department, in-

informs me that he is disappointed with the Finsen treatment of this case, and that he contemplates using the X-ray method instead at an early date.

At present the point of the nose is much damaged by the disease while the septum is in part destroyed.

My regret is now that I did not continue tha irradiations for several months at least after a cure seemed to have been affected, as I feel assured that had this been done no relapse would have occurred.

H I S T O R Y of T R E A T M E N T.

In an article named "The therapeutical Value of X-rays in Medicine", published on May, 5th, I900, in the British Medical Journal, to which fuller reference will be made later, Schiff of Vienna claims priority in this field, having been the "first to treat and cure Lupus with the Rontgen rays".

It will be noticed that Schiff does not lay claim to being the first to apply these means for cure of skin diseases, because Röntgen radio-therapy had been employed at an anterior date. Now as we must refrain from dealing with the much larger subject of Radiotherapeutics, it is obviously outside the scope of this paper to trace the early history of other endeavours than those devoted to successful attempts to cure Lupus Vulgaris.

The earliest note of cure of lupus by this means we find (Walsh. No.6. p.2I6.) is that by Dr J. Rudis-Jicisky published in the American X-ray Journal of October, I896. It has not been possible unfortunately to obtain this magazine, but we find it said that this observer found markedly beneficial effects in cases of ulcerative lupus vulgaris.

On April, 22, I897, Kümmell reported the results obtained by himself and his associate Gocht in the treatment of lupus at the 22nd Congress of the "Deutsche Gesellschaft für Chirurgie", and embodied his article entitled "Die bedeutung des Röntgen strahlen für die Chirurgie" the

details of his treatment. This article was published in the "Centrlblatt für Chirurgie" of July, I7, I897, but Messrs Williams and Norgate after much trouble have been unable to obtain a copy of that sheet, as it is now out of prinf. We find Kümmell's views fully explained however in a later article in the 'Arch. für Klin.Chirurgie' of I898, to which access has been obtained and accordingly a summary of this is given in this paper.

At the I2th annual Medical congress held at Moscow on August, 25th, I897, Freund reported his experiments on the removal of hair by the X-rays, and in his report he included at Schiff's request a statement regarding Schiff 's treatment of Lupus, stating that Schiff's article would appear later.

Schiff and Freund describe their cases in the Wien. med. Wochenschrift of I898, and this paper along with Schiff's article in the British Medical Journal above , represent the material from which are given these observers opinions. Notable among the earlier papers is one by Gocht, Kümmell's assistant, published in the first number of the Röntgen ray "Fortschritte", the date of which publication may be ascribed to the early half of I898 somewhere, though the correct date is impossible to find. An account of this article is given in this Thesis.

The earliest case described in British literature of this treatment is one by Thurstan-Holland in the Liverpool Medico-chirurgical Journal of I899, vol XIX. Other isolated cases were described soon after, but for any real

systematic work in this field at the period of the developement of the treatment we must fall back on the labours of German scientists. The most important work of these has been summarised, and incorporated in this form, in the following pages.

Each individual paper will be examined and as far as is deemed advisable analytically and critically touched upon with my own observatinns as a basis of comparison.

It is admittedly difficult to synthetise a large mass of different facts, placing each in its proper position in a scheme embracing the technique and clinical aspect of the subject, hence the simpler way has been chosen of detailing what seem the more interesting and instructive items of variation.

This paper is moreover an attempt to focus the material at our dispoaal regarding this treatment of lupus vulgaris, and therefore cannot aim at dealing in detail with the vast amount of valuable work which might be considered not only collateral, but as having a direct bearing, on the subject. The clinical effects of the X-rays on healthy skin, on diseases of the cutis other than Lupus, on diseases of the internal tissues, have been scarcely alluded to; and this limitation is obviously necessary if the scope of this paper be not enlarged beyond the bounds of a Thesis such as this aims at being considered.

S C H I F F and F R E U N D.

Schiff's article in the British Mediaal Journal of May, 5th, I900, along with the valuable case reported by Scholefield in the same number, gave me the first information by which I was led to believe that Lupus Vulgaris could be influenced for good by the action of the X-rays. The care with which Schiff lays it down as a first principle that the treatment must not be carried on with too powerful an apparatus induced me to argue that with a spark-length of only I5-I6 c.m. some degree of clinical improvement might possibly be noticed. The history of the case given above proves my supposition to have been correct. It is only necessary to add that had it not been for the matured opinions given expression to by Schiff, I should never have attempted any such treatment.

" It is advisable to take note of these factors, which in our practice proved deleterious. These are as follows: (a) A too great strength of the primary current(I½ ampères with I2 volt tension should never be exceeded). (b)A too high tension on the pole screws of the secondary coil of the transformer(induction coils of over 30 c.m. striking distance should never be used,and the mercury vessel should not be screwed too high tn the interrupter); (c)too long and too frequent irradiations; (d) the too short a distance of the vacuum tube from the skin." ~~Vacuum tubes should not be~~ ~~screened that is~~ "all these points my humble apparatus came well within the mark, and erred distinctly on the safe side. "The method", he says, " is very simple. It will be noticed that in

"The Röntgen tube, at 15 c.m."(the distance used in my case), " is so disposed that the anti-cathode stands exactly opposite and parallel to the irradiated field".
Sittings are given daily, of at first 5, then 10, then 20 minutes duration.
"The parts not to be irradiated must be protected with paste-board sheets coated with lead". A piece of sheet-lead moulded to the form of the head and with an opening to fit the part requiring irradiation seemed to me an easy way of getting over the difficulty of procuring paste-board with the coating of lead as described. "As soon", he continues, "as the skin appears turgid, or shows a pale pink or brownish tint, or when at the place in question the hairs become loose, then the irradiation of this part must be stopped".
For erythema, and pruritus, Schiff recommends 15% Boracic Lanoline, and on all occasions this proved an excellent remedy.
Details of cases are not given in this article, unless those relating to his first case, a paper on which he presented before the Vienna Dermatological Society after a few months as cured. The set of instruments required for the X-ray treatment is given, and it is further added that the action of static machines often goes a long way beyond the mark and " far from working curatively may operate injuriously on the organism".

In the Wein. Med. Wochenschrift, 1898. Schiff and Freund give particulars of two cases treated, besides referring to Schiff's first case.

In CaseI, a young man of 19 years , with Lupus Serpiginus of the neck and both cheeks, the patient was exposed to the rays 29 times, at a distance of 10-15 c.m. with durations of 20-25 min. The voltage of the primary current was 11½-12¼ volts, at 2-3 amperes.

No deleterious reaction beyond a slight erythema occurred in the process of healing.

In the 2nd case, a woman, 32 years, and unmarried, with Lupus tumidus exfoliatus of the left cheek, the size of a man's hand, 40 exposures were given of 10 minutes at a distance of 20 c.m. (11½ volts- 1½ amperes).

For three weeks the exposures were discontinued owing to a strong inflammatory reaction. ; otherwise healing occurred as in the first case as follows:

Thelupus points became very dark red and swollen and in several places normal to start with, new lupus points appeared. Later on the surfaces of these points fell away and holes the size of a pin head , with a sharp edge as if they had been made with a punch appeared. " Because of the weaker action of the rays", it is stated, "the reaction was milder and the healing process quicker than in the case which Schiff first published, so that the therapeutic effect is the more satisfactory". In place of the points scars are left, while the surface of skin lying between appears smooth and white.

This description corresponds very generally with the

the appearances observed in the above case of Lupus described by myself. The mildness of treatment , which the authors so strongly insist on, was evidentlythe cause in own case of the quite similar result.

In this paper by Schiff and Freund, reference is made to Schiff's demonstration at the Medical Congress of Ist April, I898, of the results of his first case treated. In this case the lupus had affected both sides of the fore-arm, but the part on the back of the fore-arm and hand had been exposed to the rays. After the lapse of a year the scar appeared still beautifully white, while the lupus on the flexor side of the arm had extended and taken on an ulcerative character. It is concluded from this case that the rays have little penetrative therapeutic power, or at least that the healing influence does not pass through a great portion of tissue, but spends , as it were, its power on the parts first touched by the rays. In this connection I may mention that I have carefully examined the literature at my disposal for a similar effect as I obtained on the mucous me mbrane of the nostrils, and although Hahn and Albers-Schonberg, (NO.I2.)refer to cases where the mucous membrane affected became cured, I have seen it nowhere argued that this result must be due to a considerable penetrative action of the rays.

Scholefield's Case.

This case is published in the same number of the British Medical Journal as that in which Schiff

gives expression to his views.
The case is one of Lupus affecting the nose, the alae, and the bridge. but no mention is made of the mucous membrane .
The effect of the rays is likened to a severe sunburn, and " the exposed skin dried into a scaly condition and peeled off", he says,"while the lupoid area, where thickest formed a scab". A "rubber mask of some thickness"was used ,; how it was applied is not said.
An excellent series of photographs accompanies this paper.

G O C H T .

In a communication termed, "Therapeutische Verwerdung der Röntgenstrahlen", published in the first number of the "Fortschritteauf dem Gebiete der Röntgenstrahlen", I898, (No.8.)Dr Gocht published an interesting account of cases of Lupus treated by means of the X-Rays.
This is one of the earliest records of this therapeutic procedure applied to this disease, and is therefore valuable for that reason, but it is also worthy of perusal for the many points brought prominently into notice.
Five different types of disease were treated; namely-
(I) Trigeminal neuralgia, 2 cases. (2) Mammary carcinoma, 2 cases, (3) Lupus, 6 cases, (4)Operation wound hindered in healing through growth of hair. (5)Naevus pigmentosus planus.
Technique.
The primary current is large: 50 volts. The number of interruptions is not mentioned, mor the maximum sparklength.

This is to be regretted in view of the strong reactions obtained, in some cases a violent Dermatitis having been produced.

The tubes are hard, i.e., with a high vacuum, and generally useless for photographic purposes. They are warmed before being used, this being supposed to assist the radiation.

Sittings are given twice daily, beginning with a short duration and extending to ¼, then ½ an hour.

The masks are ¾ m.m. in thickness of lead, and bent to suit the place exposed.. A small corner of unaffected skin is left exposed, in order to test the reaction on the healthy skin. These masks were not used in the first case until a relapse occurred after three weeks, and the results of this non-protection of the healthy area are exceedingly interesting.

No medicaments have been used, unless in cases of ulceration, where bandages and dry starch powder were employed.

Insulation of patient. Gocht, (and Kümmell, as seen hereafter No.II.)advised the following curious procedure. The patient was placed on a stool with glass supports, and by these means isolated. This was supposed to procure a greater and more beneficial result, but other observers are inclined to differ. (No.7.page, 330.)

Case I. A patient of 39 years had suffered for 6 years with what was supposed to be Lupus. One brother had died of consumption.

The right side of nose was very red, the skin thick, with

little knots here and there, covered by yellowish-white scales, and slimy half-dried secretion. Cervical glands were swollen. Scrapimg and Paquelin cautery had made no improvement. Eventually an ulcerating process of the hard gum appeared.

The effect of the rays was practically nil, unless that a Dermatitis developed on the part exposed.

There was no healing in the progress of the case. After some time it was discovered that the condition was a specific one, and after anti-syphilitic remedies had been administered the patient experienced great benefit.

Kümmell, (No.II.), and Hahnand Albers-Schönberg, (No.I2.) have each reported a case of gummatous syphilide, mistaken for Lupus, and treated unsuccessfully by the X-rays. In these cases the fact that no improvement took place led to the detection of the real mischief.

Gocht's first case of Lupus, affecting the right cheek, and extending to the chin, presents a remarkable picture, In the process of repair, which was carried on with no mask, at least for some time after a reaction had set in, the parts gradually assumed a pigmented condition, and after healing had taken place, a new pigmentation had arisen on the partsnot originally affected by the Lupus.

After exposure to the rays for I6 sittings, a violent Dermatitis arose, the hair fell out in pointshere and there, and later a smooth granulation surface existed, "which little by little became smaller, and healed".

A perfect healing occurred, but the result was peculiar ,

firstly in regard to the hair, which had entirely disappeared from the eye-brows, eye-lashes, upper lip, and chin, also the right temple. After two months the hair again began to growon the right temple, the right eye-lid, eyebrow and upper lip. And secondly, in regard to the pigmentation of the skin, both of the healthy part, and the healed blueish-pink new skin. Those parts nearest the tube had collected a large amount of pigment while the parts away from the tube were unaffected. On the right side of the nose and upper lip ~~appears~~(in the photo given), there is evidence of a strong pigmentation, and on the left side the skin is normal. On the large surface of new skin, next the ear side is massed towards the periphery a markedly pigmented areawhile the edge next the nose was scarcely touched with pigment at all. This result, Gocht explains, was caused by the tube being placed so that the anti-cathode allowed the rays to strike "side-ways" on the face The central part of new skin was white, with quite ordinary sensitiveness.

As nowhere else have I found an example of what may be found when the rays are allowed to act on the lupus part with no protective mask, this is my excuse for referring at such length to this case.

The other 4 cases show nothing remarkable. In all of them a vast benefit was ensured for the patient; they were all cases affecting the face, unless the last, which was one of multiple skin tuberculosis.

Details are not given sufficiently to show how strongly the

how strongly the rays reacted to produce Dermatitis, and the subsequent formation of granulation tissue, but one is inclined to gather that as his experience increased, Gocht found that by using the rays more sparingly, ~~a mil~~ a milder, but infinitely more satisfactory result was obtained.

In the discussion of the causes of the healing process we find nothing worthy of note, unless the reference to a case where an infectious inflammation of the nature of Erysipelas arose in the Lupus part, and following this ~~h~~ healing and cure took place. Gocht uses this case to exemplify how the Dermatitis of the Röntgen rays affects the disease in a similar way, producing a chronic inflammatory reaction and a consequent destruction pathologically of th e Tubercle Bacilli. He declares that it has been demonstrated that cultures of those organisms are unaffected by the rays.

He suggests in conclusion that the causa causans is to be found in the radio-chemical action , the changes being of a simslar nature to those produced on a photographic plate.

This paper is at this early period , only tentative and experimental, and does not carry the same bearing of finality, which one might ascribe to the results alredy summarized as being the matured opinions of Schiff.

We meet with more experienced views in the valuable article of Gocht's colleague, Kümmell, a review of which will now be given.

K Ü M M E L L .

In the "Archiv für Clinische Chirurgie", (1898, Page, 630) Kümmell, of Hamburg write of advanced lupus, and its treatment by means of the X-rays and concentrated light. His opinions are worthy of careful perusal in as much as by this time he has " as far as possible done away with the troublesome symptoms which accompanied the treatment," and "obtained results in cases of advanced lupus, which seem to recommend us to further application of the new agency". He complains of the want of encouragement given to Gocht, as few cases up to that time had been given in literature. Excepting Schiff's cases and those of Albers-Schönberg, no further confirmation of results had appeared. The action of the X-rays is described as being different from that of hot-air, or of the thermo- or galvano-cautery.

It is significant to note that he says further that a very deep Dermatitis is not necessary to a successful result , and by careful handling, this may be avoided. " A slight "redness, such as one sees after sunburn, cannot entirely be avoided, but even with this the treatment must be discontinued for a short time. A slight "erythema" or yellow discolouration of the skin, indicates, when the Dermatitis has begun, and compresses of Lead-water may be used to quieten the inflammation".

At first he believed that a destruction of the skin was ,necessary, but now every endeavour is used to prevent the parts being too strongly affected, and masks of

thin sheet lead or tinfoil are employed to prevent the healthy skin being injured.

At first the tube was placed at a distance of 6-10 c.m. but as this was found to be liable to produce too intense a reaction, 40 c.m. was the distance used to begin, gradually shortened to 20c.m.

It is carefully to be noted that individual peculiarity must be studied, as all patients are not alike in their susceptibility.

Patients were mostly treated twice daily, beginning with ¼ of an hour, and extending to ½ an hour.

Two large tubes were used, of 40 and 50 c.m. respectively.

Kümmell strongly recommended the use of the insulating method for patients, (see Gocht), but "strong , incalculable , and unforeseen reactions were produced, so that we soon had to cease this method of treatment". He instances a case of Naevus, in which , by this means, he obtained undesirable results.

In all, 16 cases of the treatment are given. These are grouped in the following way: Two had only been treated a very short time. Two had the disease in a slight degree only, and could be treated only for a limited period. The 5th case was that of a young man whose little finger had been cured of the lupus, but the finger had to be removed for bone disease. The 6th case (same as Gocht's?), was supposed to suffer from lupus of the nose, but no change was seen for the better. It turned out to be a specific affection and reacted to anti-syphilitic remedies.

Other 10 cases are described of patients of various ages suffering from Lupus mainly of the nose and face.

In the first case, which is possibly also Gocht's first one, the face remained healed after 9 months.

A comparison is made between the results of treatment by Tuberculin, and those by the X-rays, greatly to the advantage of the latter.

In Case, 9, the patient was affected on both sides of the face. Treatment by hot-air was demonstrated by Dr Hollander, but on one side of the face only. Healing took place wonderfully, but left a slight ectropion. Even after healing had taken place, by means of a granulating surface, a few lupus points were left.

Kümmell's conclusion is that the results obtained are the most important thing, and in this treatment smooth scars are obtained which resemble normal skin.

"The ulcers became "clean", and healed, the scab dried up and fell away in scales, the redness of skin disappeared, and gave way to a white scar. "

For small circumscribed patches excision with stitching afterwards or grafting will, he says, be preferred, but in cases of advanced or widely spread lupus, he could think of no gentler method, which preserves all the tissues which may be preserved. It produces no ectropion of the eyelids such as is seen in surgical operations.

In discussing the causation of this therapeutical effect he enters into considerable detail regarding the treatment by concentrated light as employed by Finsen of Copenhagen.

It is outwith our purpose to enter into a detailed account of the technique of this other method of Radio- therapeutic treatment. Yet it may be said that it is not natural to suppose that with such small areas exposed to the Finsen treatment at each sitting, the results cannot be expected to be so rapidly beneficial in many cases as those of the X-rays.

Kümmell's resume is surely worthy of insertion here. It is as follows:

I. The X-rays form a very valuable therapeutic means of treating and curing Lupus.

2. The healing is all the quicker and surer when the destruction of the skin is avoided, which destruction necessitates interruption of treatment.

3. A specific effect cannot be ascribed to the X-rays in regard to successful action on Lupus.

4. The healing of Lupus by X-rays does not depend on an acute Dermatitis produced by too strong a current or by too small a distance between object and tube, but on some influence on the lupus tissue, which is not yet clearly understood. Perhaps it is an electro-chemical process or a "trophoneurotische" influence.

5. The same may be said of the concentrated light (Finsen) by which Lupus is also favourably influenced and also healed.

6. The scars produced by treatment are far smoother and nicer than those produced by any other method. Contraction of scars with their minor effects have not come under our notice.

7. In treatment of large lupus patches, the X-rays are to be preferred to the concentrated light.

G A S S M A N N & S C H E N K E L .

The paper published in the 2nd number of the Rontgen-ray "Fortschritte", differs from the others in the respect that the four cases detailed show an extreme reaction to the X-ray treatment. The results are the more valuable on this account because the intensified actinn is as much requiring study as the milder method by which it is by most now deemed advisable to treat Lupus, andthrough which my own case was to a certain extent successfully manipulated.

The cases given by the above authors were 4 in number, the first being a case of Lupus of I2 years standing , affecting the skin of the cheek near the ear, and of the size of a man's hand. After repeated sittings a bright red , smooth, varnished-looking granulation surface resulted, which bled easily. The granulations were scraped with a sharp spoon, and under the surface a soft fibrous tissue appeared on which skin-grafting waa performed. the skin being taken from the thigh. Healing then occurred, but after 7 months in many places tubercles of 2-3 m.m. in size existedone of which when removed proved to be typical lupus. Wet bandages had been applied during the course of the treatment. in order to allay the Dermatitis; and it was noticed that while after the first sitting this in-

inflammation rose at once; in the second and third occasions on which the sittings were resumed, the reaction in each case took a longer time. to develope.

Case 2 was that of a girl. aged I6, with lupus of nose and upper lip. The reaction was similar to the last in this respect that after a time the lupus tissue of the nose had dis-appeared and in its place a bright red smooth surface existed. the irradiations were continued until the upper lip became the same, but the epithelial edges were long in beginning to cover the granulations. Skin grafting was again done, but soon after the skin healed lupus points were observed in the healed surface, which was slightly pigmented, light brown in colour, and partly covered by crust.

Csae 3 was one of Lupus ofthe face in a girl of 22 years, the ulcer being about one c.m. in diameter, and covered by crust.

The irradiations caused marked raaction of dermatitis, so that even the fore and middle fingers of the right hand which carried the mask became swollen and red.

Again the whole surface irradiated changed into a superficial ulcer with a smooth bright red surface, while the surrounding tissue became red and swollen.

The skin-covering proceeded very slowly and in the mean - time a necrotic layer had formed. This was scraped , but later a greenish scab replaced the fi rst layer. Papayatin was used with no result, and gradually the necrotic area increased to 6--7 c.m. the size of the opening in the mask

while the pain and burning had to be treated with ortho-form and morphia.

Case 4 showed lupus affecting the hand in a person I4 years of age. The 3rd and 4th metacarpals, and the 3rd and 4th metacarpophalangeal joints were ulcerated and covered with crust.

Again after irradiations the whole surface changed into an ulcer, surrounded by swollen painful skin. The granulated area again looked as if it had been varnished.

Another case is described in this paper (one of Sycosis non parasitoria), but it is without the scope of this paper.

The authors then discuss thesecases fully in the context, and their observations are very instructive.

They admit that they have not observed the typical method of healing described by other authors. They comment on the remarkable fact that all four cases show the same result after repeated irradiations; namely a smooth red varnished-looking surface, with tenderness an d pain around.

In the first case they further noticed that the skin-grafting was not so successful as in other cases of ulcerbut in the second case the skin-grafting produced a layer of skin which had the appearance as the first described by Gocht, namely a pigmented area which gradually grew paler while a zone of pigmentation occurred at the edge of a brownish yellow colour.

The authors admit that while cases of ulceration have occurred through irradiating the normal skin, a mistake had been made in treating these cases so energetically.

The causes of this intense reaction they declare must be either, (a) a too short distance of the tube, or

(b) too long exposure, or

(c) sittings following too closely on each other, or (d) individual predisposition.

Discussing these causes, they admit that while in the second case, the tube might, with advantage, have been placed further from the patient, and the time of exposure shortened, there was undoubtedly great sensitiveness on the part of the subject.

The authors then compare their own technique with that of others. The following table explains itself:

Author.	Primary Volts.	Distance.	Spark-length.	Time expos.
Kummell. and Gocht.	50	40- "20 c.m.	40-20 c.m.	I5-30 min.
Albers-Schonberg.	30. 4 - 5 amps	I5-25 c.m.	I5c.m.	30min.
Schiff, and Freund.	II½-I2¼ 2-3 amps.	I0-20c.m.	I0-25c.m.	I0-25min.
Gassmann &Schenkel.	30 3-4 amps.	20c.m.	45c.m.	30 min.

In the first case Dermatitis appeared after I9 sittings, and treatment was discontinued, and only after 30 irradiations did the ulceration occur, and that without any inflammation of the healthy skin preceding it. So also in case 4. the dermatitis appeared earlier in the affected parts than in the normal tissues.

In case 3, the Dermatitis began immediately after the

first application(20min. of I5c.m. distance), while after a third resumption of the sittings Dermatitis again occurred. Four weeks after the last sitting the affected area began to grow gangrenous, and at four months after , the whole tissue was necrotic. This the writers think "a striking example of the cumulative action of the rays".

A brief account of the histological examination of this above-mentioned necrotic layer will be given later.

Considering the question of relapses, the authors say that two cases relapsed, namely the first and second, the first after 7 months, the second after 6, the first having undergone 57 irradiations, the second, 4I. The treatment cannot have been due to want of intensity of the application of the remedy, but to the want of continuation thereof. They consider that many months are necessary to establish a cure.

Again they point out that small "doses " must of necessity be made to start with, in order to try to establish a "tolerance". A cumulative action, however, may be going on after the disappearance of the dermatitis, and this is shown by the unexpected inclination to "gangrene".

Apart from the clinical reactions observable, the authors say, we cannot depend on any certainty of the physical conditions under which irradiation takes place.

This paper then procedes to show how uncertain a method this is with which we have to deal; how that tubes which seem to act photographically in a similar way have different effects when used for Radio-therapy, how tubes vary largely in

in their liability to become evacuatedwith use, how the variations of the secondary current of the conductor ought to be if possible, measured, how the number of interruptions per minute is an important factor in the equation as seen by the action of the rays in photography as compared with that on the fluorescent screen.
The authors then procede to give an analysis of the records they intend making in future cases of the different items of technique. They emphasise the importance of measuring the spark-length, and caution their readers against the advertisements of makers who attempt to guarantee tubes of a certain maximum spark-length.
Finally, they assert that as no easy way of measuring the intensity of the rays, one is obliged to fall back on the "subjective" indications of the "Cryptoscope".

H A H N and A L B E R S-S C H O N B E R G.

Münch. Med. Wochenschrift. Feb:20, 1900.

The last of the German papers on this subject, which it has been my privilege to examine is that by Hahn and Albers-Schönberg, in the above Medical Journal.
In many respects this is the mast conclusive as well as the most satisfactory publication of all. And this for several reasons:(1)Due attention is paid to after-treatment and relapses, and (2) The work of Gassmann and Schenkel is given due prominence, and its fitting place is bestowed on the , (may I call?), "intensive" treatment.

Instead of using the limited means of operation by the careful and systematic prevention of dermatitis, they in their published cases, (I2 in number), recognise the value of the production of dermatitis, and consequent excoriation, and assign to it its proper place in the cure.

So far as the literature of the subject has been covered in this paper, the most final word seems to be here spoken.

As tp predisposing causes of the effects of treatment, we see mentioned,(a) individual peculiarity, or susceptibility to the rays, in some producing little or no reaction, and in others excoriation and gangrene. (b)complexion, which has no effect, (c)age, with no effect either, and (d) sex, which makes no difference unless in some cases where females wear veils and make their skin less hard than what we find is the usual condition in men.

The effects of the rays on the skin is then described; namely, redness, (hyperaemia), then dark dull redness, with feeling of warmth and itch, and sometimes burning pain. Then an oedematous condition occurs, with feeling of tightness, and to the touch a brawny indurated sensation. This is followed if still further irradiated, by small excoriated parts, and these soon cover the exposed parts. and resemble a burn. These conditions may appear at once, or not until several days have elapsed after irradiation. The latter shows the "cumulative" effects of the "doses". If the treatment be discontinued when hyperaemia appaars, the redness remains a few days, then slowly recedes, showing a pinker paler skin, with here and therehyperaemic spots, while the elasticity

the elasticity decreases and a dry leathery skin with close clinging epidermis in the form of scales is found.

These scales come away in great numbers but continue to form again, while hair and lanugo fall out.

If the irradiations are stopped after oedema has been formed, healing occurs by the gradual diminution of swelling from without inwards. But if excoriation takes place on the oedematous part, healing takes place much more slowly. As healing does take place, a smooth skin of very delicate texture, and pinkish colour forms , leaving no true scar. Healing may therfore take place in 2 ways:

(1)In sensitive persons, where there is advanced disease, an excoriation may be produced which appearsas a smooth red patch of granulations, while the Lupus points have disappeared. This may heal, and a perfect cure result.

(2)In healing with a mild reaction, there seem to be two ways of healing of the points(a)where the red hard scaley skin loses the scales with no hyperaemia, although the points are distinctly visible because of their dark colour and protrusion. Gradually with the falling away of the scales the points disappear and normal skin results.

(b)When a reactive hyperaemia sets in round the points, and a scurf is seen, under which healing of the points takes place.

Ulcers. In cases of ulcers secretion soon stopped, a scab formed, and under this scab the healing process took place from without inwards.

Special treatment.

Electrolysis is sometimes employed in small patches, and also in some cases of Lupus Verrucosus with much benefit. Unna's green ointment was used in ulcerated cases with great advantage, the following being the formula:

R/Acidi Salicyl.
Liq. Stibii Chlor. aa 20
Creasoti fagi
Ext Cannab. Indic. aa 40
Adip. Lanae 80.

There is now given an account of I2 cases of Lupus, where the cure was complete, although relapses occurred in a few. The salient features in each are as follows:

I. Lupus of nose, septum destroyed. Complete cure, with only towards end of treatment excoriation of a small part. No relapse after a year.

2. Lupus, size of sixpence, on both sides of cheek and brow. Excoriation on I6th day, but after 25 days, all parts healed with at edge an accumulation of pigment. No relapse after I½ years.

3. Left cheek and right side of nose, two patches, size of sixpence. Slight excoriation, which healed rapidly. On left side appeared a patch which yielded to electrolysis. After lapse of three months a yellowish brown spot appeared, but on the left side of nose. This was acted on by the rays, and healed. This part had not previously been irradiated, so the authors conclude that this argues in favour of the treatment rather than against because

up

up til the date of writing no relapse had occurred on the previosly irradiated part.

4. In this case the mucous membrane was affected, and in the course of treatment almost but not quite healed. A relapse appeared in this case, but it was noticed that the points were developed much more slowly, and the points which developed in the irradiated part were much less intense than those developed in the area not irradiated.

5. During the treatment of this case, the apparatus went wrong, and in the interval, Unna's Salicylic and Creasote plaster was used. The treatment having been resumed, progress took place more quickly, so that the authorsdetermined to combine the processes.

6. No relapse after 9 months. Slight excoriation in healing.

7. No relapse after IO months. Drying up process, with only slight excoriation.

8. Cured for 7 months.

9. Treatment with Unna's paste, as above. A few months after a spot appeared, which was treated electrolytically. No relapse after 6 months.

IO. Mucous membrane affected as well as nose, upper lip, and septum. Drying up occurred, and after 6 months no relapse. Mucous membrane entirely healed.

II. Ulcerated lupus of nose, bridge of nose, naso-labial folds, septum narium, and upper lip; no relapse after I½ years.

I2. Shows lupus of mucous membrane. Drying up of parts, although the mucous membrane was not much affected by

the treatment.

The authors consider that cases, I, 2, 5, 6, 7, II, I2 are completely cured after a lapse of 9 months to I½ years. In case 3, the irradiated part at least showed no sign of relapse. In cases, 8 and 9, the time is too short to say anything definite. Cases 4 and I0 may be regarded as suspicious. In case 4, there were two relapses, but for 6 months there have been no suspicious signs.

Another 6 cases are given of severe Lupus of the face, but these do not call for particular attention.

The authors summarise as follows:

"The Rontgen rays may be so easily worked, and the dose so accurately administered, if one understandsthe working of them, that such things as burns should never happen. A great mistake which often is made, in the treatment of Lupus and other skin diseases, is to expose the skin too long and too intensely, so that excoriation or rather dermatitis is produced. Dermatitis must only be produced intentionally when small circumscribed lupus patches are being treated, and even in these cases we would prefer to treat them electrolytically, or by Unna's method. The X-rays meet a felt want in treatment of larger patches, and not isolated small knots".

Technique.

Tubes. The harder they are the better. Old much used tubes useless for photo work should on no account be used.

The distance of tube should be to begin with, 25-30c.m.

The authors recommend 40-50c.m.spark-length coils.

The sitting should be begun with 10 minutes duration and then extended to 20, or 30 minutes.

Masks should never be omitted.

Finally, they say, " We have in the X-rays a remedy which treats lupus and skin diseases efficiently, without any doubt. It does away with eczema accompanying lupus, and the swellings caused by the same. It is the remedy for superficial treatment, and treatment of larger lupus patches. Relapses are not excluded from this treatment, any more than from any other. The treatment by X-rays does not exclude other forms of treatment, in fact it helps them, and may be combined with themto advantage. What we say of Lupus may be said of eczema and of other skin diseases. Given the proper dose, and experience in working we can avoid all harmful symptoms such as Dermatitis etc".

THURSTAN-HOLLAND'S CASE.

In the Liverpool Medico-chirurgical Journal, 1899, the above author records a case of Lupus treated successfully by means of the X-rays.

The patient was a boy of 16 years, suffering from ulcerating lupus of the face, which had resisted the application of various remedies.

A 16-inch coil was used, with tube at a distance of 4-5 inches, and 17 irradiations were given.

After 11 exposuressome hair fell out over the temple, and the ulcers began to dry up. Healing occurred and remained for 3 months, being still the same at the time of writing.

The author remarks that no dermatitis occurred, but a change for the better began at once and continued all through the treatment.

STARTIN'S CASES.

In the Lancet of July, 20, 1901, Startin of the London Skin Hospital describes five cases of Lupus and Rodent Ulcer treated successfully by the X-rays.

With a 15 inch coil, 16 volts of primary current at 3-5 ampères, interruptions of 250 per minute, and a distance of tube of 5 inches, he gave 4-5 exposures in consecutive days.

"In cases of Lupus", he says, "the skin becomes slowly red after the first 4 sittings, the nodules bright red and shining, and the pus dries up with no doubt destruction of bacteria. After a few days scabe form then drop off leaving a glazed surface, which may or may not scab over again. This

"This process goes on until no more scabs are formed, and the surface is smooth and normal. The surfaces acted on become slightly oedematous and a healthy epidermis begins to form".

It will readily be seen that the method of healing described here is more similar to that described by Gassmann and Schenkel in the above notes, and not at all like the simple drying up process without dermatitis , which was found in mybown case, and Holland's above.

KNOX'S CASE.

In the Journal of the American Medical Association, Nov, I900, Knox of Cincinnati reports a case of cure of Lupus of the nose by means of the X-rays.

The case was one of lupus in a woman aged 20years.

The techniquewas as follows: The rays were applied for 6-I0 minutes at each sitting every other day, the affected parts being placed at a distance of 4-8 inches from the tube.

In all 74 irradiations were given, and improvement began at once, in what manner the author does not observe.

He regards the treatment as infallible " if properly applied and continued for a sufficient length of time".

HALL-EDWARD'S CASES.

In the February number of the Edinburgh Medical Journal, 1900, there appears an interesting paper by the above author on "The physiological and therapeutical effects of the X-Rays".

In the introductory portion he calls attention to the work of Nicola Tesla, on the "Hurtful Action of the Röntgen rays", and quotes him in saying, that"in severe cases" of burns, "the skin gets deeply coloured, and ugly ill-foreboding blisters form"

Technique. The apparatus consisted of a spark-coil of I2-I6 inches in spark-length; the accumulator of the priary current gave 8 amperes at I2 volts; and the tube was placed at a distance of 8-I8 inches from the object.

The author gives two cases of Lupus Vulgaris treated, and one of Lupus Erythematosus.

In the first case of Lupus Vulgaris, the disease had attacked the patient at various places, but only a limited patch on the instep of the left foot was taken for treatment as an experiment, a mask of lead being used to exclude the portion of the patch not to be irradiated, and also the healthy tissues.

In this case and also in the other of Lupus affecting the thigh, healing only occurred after a large granulating surface had formed. The skin healed from the edges as in an ordinary ulcer, or burn of the third degree.

NOTE on the HISTOLOGY of LUPUS treated by X-RAYS.

It may be assumed in the first instance that ordinary Lupus tissue is mainly composed of nodules typical of tubercular disease affecting other parts, these nodules in the cutis and adjacent structures being made up of giant-cells, with their concomitant reticular mesh-work and surrounding area of leucocytes. The giant cells contain tubercle bacilli in their protoplasmic part, but they, on the other hand may contain no organisms .

The method of healing which takes place in lupus tissue is similar to that which occurs frequently by natural means in tubercular affections of other structures, such as in the lung, and joints. The giant cells become granular the fibrillary net-work forms into cicatricial tissue, the leucocytes contributing their share of the fibrosis until healing takes place.

"The giant cell", says Hamilton, (NO. I6)(p. 426), "becomes more and morefibrous towards the periphery, at the expense of the protoplasmic part in the centre. The protoplasm of the cell evidently becomes transformed into or secretes the fibrous margin. This fibrous periphery is covered with nuclei which appear to be derived from the giant cell. In course of time the previously uniform fibrous border splits up into bundles, the nuclei still lying upon them. The fibrous transformation ultimately seizes upon the protoplasmic remains of the giant cell in the centre so that the whole giant cell and tubercle nodule become con-

converted into a mass of fibrous tissue. The cicatrisation if it may be so called, in fact represents the healing of the tubercle, and is the natural course it follows if its full development is not interrupted by caseation or other contingency. In this stage the tubercle bacillus vanishes".

This then being nature's method of healing, we ask ourselves , how and by what means or processes do the X-rays procure a similar result in cases which have baffled not only nature, but even the skilled assistance of the surgeon?

Firstly then , as to the action of the rays on the bacilli, we find a conclusive statement given by Pusey, (No.7.) (p.279.), who says, "the fact that organisms in living tissues can be destroyed by exposure to x-rays, while the same organisms in inert cultures are uninfluenced by x-ray exposures, proves positively that it is not the influence of x-rays per se that causes the destruction , but that the tissues themselves doubtless under conditions of activity excited by the rays, playtha importantrole in the germicidal process".

Secondly , if this be the case, and it is now generally granted to be so, that the action of the rays is on the structure of the tissue, what information have we of this alteration.?

The action of the rays on healthy skin must be considered (i.e. histologically), before we can attempt an answer to this question.

Scholtz(No.17.p.241.)thus describes the reaction on healthy skin: "The X-rays influence especially and exclusively the cellular elements of the skin.-----A degeneration affects the epithelial cells in the highest degree.
As soon as the degeneration of the cells has reached a certain point, an inflammatory reaction appears, which manifests itself in a marked dilatation of the vessels, with gathering of the leucocytes, and marked immigration of the bloodcorpuscles. When greater cell degeneration occurs as a result of stronger exposure, collections of leucocytes press into a mass of degenerated cells and accomplish their further destruction". "The changes in the large and small vessels are apparently of great importance as affects the further development and slow healing of the ulcerations".
It may be mentioned here that the immediate results obtained by Gassmann and Schenkel in their cases , a report on which has already been given in this paper, correspond to the above description of continued irradiation applied to healthy skin until ulceration had formed.
These authors removed a piece of necrotic tissue from the affected part of one of their cases, and embodied the results of the examination in their paper.(No.10.p.121.)
Instead of finding tissue entirely destroyed they were able to observe that the various component cellular elements had undergone only partial disintegration, while it was particularly noticed that the blood-vessels were affected in a curious manner, the intima of the vessels being

thickened and vacuolated, and in many cases of smaller vessels the lumen was occluded altogether.

The changes observed in the milder treatment of lupus by the rays, are given by Scholtz,(No.I7.), who states at once that the alteration of structure of tissue is similar to those changes which the rays bring about in normal skin. "First, degenerative processes in the cellular elements and epithelioid cells of the lupus tubercles themselves; which are followed by the appearance of an inflammatory reaction". "The healing of the lupus and the destruction of the bacilli result thus from the reactive hyperaemia and inflammation , and we can draw no deduction as to any bactericidal properties of the x-rays. The principal peculiar important effect of x-rays in the treatment of lupus lies in the reactive inflammation concentrated upon the affected spot, which results from the degenerative processes induced in the tubercles".

Schiff says, (No.I.)"In cutaneous affections , with inflammatory infiltration and new growth of young tissue, the cellular formative elements get altered in their molecular composition, and thus prepared for absorption. ".

Hahn and Albers-Schonberg in the paper above summarized, (No.I2.), tell that they removed a piece of affected skin from the face of one of their cases, and submitted it to Dr Hueter for examination. The conclusions are similar to above, with careful details of the condition of the various cellular elements found in the tissue.

Lastly

Lastly I beg leave to give the brief conclusions of Grouven, published in the "Fortschritte" of 1902, and a translation of the following lines of which are given by Pusey in his book, (No.8.)

"The course of healing of lupus is as follows:Hyperaemia, leading to increased diapedesis of leucocytes, first at the periphery of nodules, pressing on into interior, changing into spindle cells and connective tissue cells.The cells of the nodules undergo degeneration and absorption, and are replaced by connective tissue".

One would naturally conclude after examining the above statements regarding the inner microscopical working of this mysterious influence which the X-rays exert on the diseased skin of man, thatunless it were impossible to avoid injurious reactions on the skin, evry precaution should be taken to prevent a dermatitis in the part irradiated, so as to encourage that process or those processes which seem to be in harmony with nature's endeavours to cure the evil malady.

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